DOCUMENT RESUME

ED 077 969 TM 002 778

TITLE	[Computer Program PEDAGE -- MARKTF-M7-F4.]
INSTITUTION	Toronto Univ. (Ontario). Dept. of Geology.
PUB DATE	20 Apr 66
NOTE	14p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Computer Programs; *Data Analysis; Input Output; *Scoring; *Student Testing; *Test Results
IDENTIFIERS	*PEDAGE System

ABSTRACT

The MARKTF-M7 computer program, written in FORTRAN IV, scores true/false tests by comparing a control list of T/F values prepared by the instructor with those obtained from the students. The output, primarily for the use of the instructor, consists of a listing of the names of the students with their respective marks prior to the test, the test scores, and the combined scores as the final marks. In addition, statistics on means, frequency distribution of the scores, and examination items answered correctly are tabulated. This program can be used for large classes and/or large examinations (up to 5,000 students and 810 items), but since the scoring is done in a one-pass process, no intermediate tape or disk storage is required. It was designed especially for easy preparation of the data deck and small expenditure of computer time. The method, error messages and default conditions, data acquisition, the FORTRAN program, and the data deck are presented. (For related documents, see TM 002 789-793.) (DB)

ED 077969

TM 002 278

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DEPARTMENT OF GEOLOGY
UNIVERSITY OF TORONTO
TORONTO, ONTARIO
CANADA

Information on computer programs of the PEDAGE system, for use in scoring and analyzing methods of teaching and examining knowledge of factual material.

MARKTF-M7-F4

April 20, 1966

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ED 077969

University of Toronto
Department of Geology

Computer program MARKTF-M7

Written in FORTRAN IV source language

For an IBM 7094-II computer under IBSYS monitor control.

Conforms to current conventions of the Institute of Computer Science, University of Toronto.

TM 002 278

Purpose. This program scores true/false tests by comparing a control list of T/F values prepared by the instructor with those obtained from the students. The output, primarily for the use of the instructor, consists of a listing of the names of the students with their respective marks prior to the test, the test scores, and the combined scores as the final marks. In addition, statistics on means, frequency distribution of the scores, and examination items answered correctly, are tabulated.

This program can be used for large classes and/or large examinations (up to 5000 students and 810 items), but since the scoring is done in a one-pass process, no intermediate tape or disk storage is required. It was designed especially for easy preparation of the data deck and small expenditure of computer time.

Method. The general scheme of examination by statements that are true or false is the same as that described in prior information booklets of this series, expecially MARKTF-M3, -M5, and -M6. However, these programs assume that the number of examination items is 81 or less, allowing all of the test data to be coded on one of the mark-sense cards used in this system. Program MARKTF-M7 assumes that the number of items is 810 or less, on one to ten mark-sense cards, and this limit could be increased considerably by a minor change in the program. For practical reasons, the examination items should be considered to be in sets of 81 and the user must place them in proper sequence. Some suggestions regarding procedures of examination and preparing the data deck for this program are outlined below.

The prior programs of this series limited the number of students tested to 200 in order to keep all the intermediate storage in the high speed part of the computer while the data are processed in various ways. This program does not

store the T/F data for each student, but simply scores each response, stores the results, and then proceeds. The maximum number of students is limited to 5000 in this program, but the maximum can be increased considerably by minor changes in the program.

First, the title of the examination is read from the data deck and printed at the top of a new page.

Second, a set of control numbers is read: the total number of T/F statements, the number of students, and the weight the examiner has selected for this test relative to the prior cumulative percentages the students had earned. The value of the weighting constant is relative to a weight of unity for the prior marks. Thus if the test scores are to have twice the weight of the cumulative marks, the data card value of the weight would be 2.0.

Third, the T/F control data of the instructor are read, decoded, and stored.

Fourth, the T/F test data, prior mark, and bonus for the first student are read. The T/F data are decoded and compared, item by item, with the control data. A mark is added for being the same and one is subtracted for being different. The total is converted to percent, and called the test score. The test score is stored in two of 21 classes of ten percent size (up to 5, 0-10, 5-15, etc.) for later printing of a frequency distribution. The test score is combined with the prior mark to give a final score, using the relative weight constant and the bonus, and similarly is stored for later printing of a frequency distribution. As the T/F scoring is being done, information on correct scoring of each examination item is stored for later printing of the fraction of the students who evaluated each item correctly. Finally, the results for this student are output for printing on a line.

The reading, scoring, storage of general results and printing of particular results continues through the T/F test data deck until each student response is processed. Then the general results are processed and printed. The frequency values for the test scores and final scores are printed on a separate page. The table of the examination statement numbers and the corresponding fractions of the students who evaluated them correctly is printed. This table is organized in sets of 81, as explained above, in order to facilitate correlating the relative values with the examination statements.

Error messages and default conditions. If the number of statements or the number of students are not right-registered in their respective data card fields of six columns, the numbers as read may exceed the limits of the program (810 and 5000). If the limits of either are exceeded, a line of printing noting this is printed and execution is terminated.

If the weight of the test scores relative to the prior marks is read as negative or zero, a line of printing noting this is printed and execution is terminated.

If any one of the 27 characters resulting from the punching of the MS information in the control cards or the student response cards is illegal, this is detected by the decoding subroutine and a logical switch is set for a test by the main program. If the illegal character is in one of the control cards, a line of printing noting this is printed and execution is terminated. However, if the illegal character is in one of the student response cards, processing is not interrupted and the notice--PUNCHING ERROR IN DATA CARD-- is added to the printed line containing the name and score. One illegal character would be decoded as three values of true in one MS column, and, although this could change the score considerably, on the average it would not change it very much. The tagged line gives the instructor information about where to find the bad data card in the deck. (Illegal characters most often are due to pencil marks on the MS cards in other than the outlined places.)

Data acquisition. The program was designed with the assumption that the T/F statements making up the examination are in sets of 81, although less than 81 may be present in the last set. That is, all of the 81 MS positions are used for scoring on each card except possibly the last one. Consequently, the numbering of the statements should be 1-1, 1-2, ..., 1-81, 2-1, 2-2, ..., 2-81, etc., or the different sets could be labelled A, B, C, etc.

The chance of mixing the order of the student response cards could be reduced by color coding them in some way. This was tested in practice and found to be feasible. In a four-card test, the MS cards for the student responses were pink, orange, yellow, and green and the final data deck was relatively easily checked for cards out of place.

If one of the student response cards is out of place, two cards are involved, and the resulting score for two sets of 81 statements will be near zero. Thus a comparison of

the prior marks and the test scores would show a large discrepancy. In this case the deck could be put into correct sequence and rerun with the program.

With or without color coding the MS data cards, they could be prepunched with CARD 1, CARD 2, etc., or FIRST SECOND, etc., in columns 73-80, since these columns are not read during execution of the program. This method would decrease the number of mistakes made by color-blind students and would be easily checked on a pre-run listing of the deck.

Further details regarding the MS cards used in this kind of examination and the MS punching into the first 27 columns of the cards, are described and illustrated in the information booklets on programs MARKTF-M3, -M5, and -M6.

The first card in each student response sub-deck contains the name, prior cumulative mark in the course, and bonus to be added to the score of the test before combining with the prior mark. These data may be in each card of the sub-deck but they are read only from the first one. A practical procedure is to prepare prepunched and printed MS cards with the names of the students in the course. Thus the students mark cards containing their names printed along the tops. After the test, card 1 of each student subdeck is punched with the corresponding prior mark and bonus, if any. (The field for the bonus may be left blank if no bonus is intended.)

After the data deck is checked for proper sequencing, it should be duplicated before running with the program. This eliminates possible card-reading difficulties caused by rough spots at erasures on the originals.

The FORTRAN program. On the following pages are listings of the main program and the decoding subroutine that it calls (DECODE-M2-F4), along with a specimen data deck for a four-card examination. This is a synthetic deck made up of four one-card tests, but illustrates the generality of the sequencing. The printed output of a run with this deck is shown in following pages.

The program is available in the form of column-binary (machine-instruction) cards (labelled MTF7 and DECOM2), and this would be the form that the program normally would be used.

The data deck. The format of the data cards are as follows:

1) $DATA, starting in column 1 ;

2) Title of the examination, using any key-punch character, in columns 1 to 72;

3) Number of items in columns 1 to 6, as an integer registered to the right, number of students in columns 7 to 12 as an integer registered to the right, weight of this test relative to the prior cumulative mark as a decimal point number anywhere in columns 13 to 18;

4) Control T/F marks in three rows and 27 columns as punched into the first 27 columns of the card, and as many cards as required for the test (four cards in the example shown on following pages);

5) Student response cards similar in character and number to the control cards, but also containing information about each student, the name in columns 28-63, the prior mark as a decimal point number (percent) in columns 64-68, and bonus as a decimal point number (percent) in columns 69-72, and any kind of other comment information in columns 73-80.

```
$IBFTC MTF7     DECK
C** PROGRAM MARKTF-M7-F4 **
C** CODED BY F.G.SMITH, DEPT.GEOLOGY, UNIV.TORONTO, MAR.28, 1966 **
C** SCORES T/F TESTS UP TO 810 STATEMENTS AND 5000 STUDENTS **
C** INPUT T/F DATA ARE ON 81-PLACE MS CARDS PUNCHED IN FIRST 27 COLS **
C** OUTPUT 1--NAME,PRIOR SCORE,BONUS,TEST SCORE,FINAL SCORE **
C** OUTPUT 2--FREQ. OF TEST AND FINAL SCORES IN 21 CLASSES OF 10 PC **
C** OUTPUT 3--INDEX OF CORRECT SCORING OF THE TEST STATEMENTS **
      DIMENSION TITLE(12),CODE(270),TAN(810),ANS(810),NAME(6),
     1 TFSTAT(810),SCORE(5000),GRADE(5000),SFREQ(21),GFREQ(21),CLASS(21)
      DIMENSION INDEX(810)
      INTEGER CODE,TITLE
      LOGICAL TAN,ANS,OK
      COMMON NCARDS,CODE
      DATA ZERO,ONE/0.0,1.0/
      DATA (CLASS(K),K=1,21)/0.0,5.0,10.0,15.0,20.0,25.0,30.0,35.0,
     1 40.0,45.0,50.0,55.0,60.0,65.0,70.0,75.0,80.0,85.0,90.0,95.0,
     2 100.0 /
      DO 60 K=1,810
      N=K-81*((K-1)/81)
      INDEX(K)=N
   60 CONTINUE
    1 READ(5,11) TITLE
      WRITE(6,21) TITLE
      READ(5,12) NSTATS,NSTUDS,WT
C** NOTE THAT WT IS A REAL NUMBER, THE RELATIVE WEIGHT OF THIS TEST,
C   IF THE WEIGHT OF THE PRIOR CUMULATIVE SCORE IS UNITY **
      IF((NSTATS.GT.810).OR.(NSTUDS.GT.5000)) GO TO 1001
      IF(WT.LE.ZERO) GO TO 1002
      NCARDS=(NSTATS+80)/81
      NCOL=27*NCARDS
      STATS=NSTATS
      RECSTA=ONE/STATS
      STUDS=NSTUDS
      RECSTU=ONE/STUDS
      WTPLUS=WT+ONE
      DO 90 K=1,810
      TFSTAT(K)=1000.0
   90 CONTINUE
      DO 100 K=1,NSTATS
      TFSTAT(K)=ZERO
  100 CONTINUE
      READ(5,13) (CODE(K),K=1,NCOL)
      OK=.TRUE.
      CALL DECODE(TAN,OK)
      IF(.NOT.OK) GO TO 1000
      WRITE(6,22)
      SAVER=ZERO
      GAVER=ZERO
      DO 200 N=1,NSTUDS
      OK=.TRUE.
      READ(5,14) (CODE(K),K=1,27),NAME,CUMPC,BONUS
      IF(NCARDS.GT.1) READ(5,13) (CODE(K),K=28,NCOL)
      CALL DECODE(ANS,OK)
      SUM=ZERO
      DO 160 K=1,NSTATS
      IF((TAN(K).AND.ANS(K)).OR.(.NOT.TAN(K).AND..NOT.ANS(K))) GO TO 130
      SUM=SUM-RECSTA
      GO TO 160
  130 SUM=SUM+RECSTA
      TFSTAT(K)=TFSTAT(K)+RECSTU
  160 CONTINUE
```

```
      SUM=SUM*100.0
      FINAL=(WT*(SUM+BONUS)+CUMPC)/NTPLUS
      IF(.NOT.OK) GO TO 170
      WRITE(6,23) NAME,CUMPC,BONUS,SUM,FINAL
      GO TO 175
  170 WRITE(6,24) NAME,CUMPC,BONUS,SUM,FINAL
  175 SAVER=SAVER+SUM
      GAVER=GAVER+FINAL
      SCORE(N)=SUM
      GRADE(N)=FINAL
  200 CONTINUE
      SAVER=SAVER/STUDS
      GAVER=GAVER/STUDS
      DO 250 K=1,21
      SFREQ(K)=ZERO
      GFREQ(K)=ZERO
  250 CONTINUE
      TOP=5.0
      BOT=-100.0
      DO 300 K=1,21
      DO 290 N=1,NSTUDS
      IF(SCORE(N).GT.TOP) GO TO 280
      IF(SCORE(N).LE.BOT) GO TO 280
      SFREQ(K)=SFREQ(K)+RECSTU
  280 IF(GRADE(N).GT.TOP) GO TO 290
      IF(GRADE(N).LE.BOT) GO TO 290
      GFREQ(K)=GFREQ(K)+RECSTU
  290 CONTINUE
      TOP=TOP+5.0
      BOT=TOP-10.0
  300 CONTINUE
      SFREQ(21)=2.0*SFREQ(21)
      GFREQ(21)=2.0*GFREQ(21)
      WRITE(6,25)
      WRITE(6,26) (CLASS(K),SFREQ(K),CLASS(K),GFREQ(K),K=1,21)
      WRITE(6,27) SAVER,GAVER
      DO 400 N=1,NCARDS
      IF((N-3*(N/3)).EQ.1)WRITE(6,29)
      WRITE (6,31)N
      KSTART=81*(N-1)+1
      KEND=KSTART+80
      WRITE(6,30)(INDEX(K),TFSTAT(K),K=KSTART,KEND)
  400 CONTINUE
      GO TO 1
 1000 WRITE(6,32)
      STOP
 1001 WRITE(6,33)
      STOP
 1002 WRITE(6,34)
      STOP
   11 FORMAT(12A6)
   12 FORMAT(2I6,F6.1)
   13 FORMAT(27A1)
   14 FORMAT(27A1,6A6,F5.2,F4.1)
   21 FORMAT(1H1,9X,12A6 ///)
   22 FORMAT(1H ,9X,4HNAME,32X,28H  PRIOR  BONUS   TEST  FINAL //)
   23 FORMAT(1H ,9X,6A6,4F7.1)
   24 FORMAT(1H ,9X,6A6,4F7.1,29H PUNCHING ERROR IN DATA CARD )
   25 FORMAT(1H1,9X,50H  CLASS    FREQ(TEST)          CLASS    FREQ(FINAL
     1)  ///)
```

```
   26 FORMAT(1H0,9X,F6.1,F12.4,10X,F6.1,F12.4)
   27 FORMAT(1H0,9X,10HAVERAGE = ,F7.2,11X,10HAVERAGE = ,F7.2)
   29 FORMAT(1H1,9X,66HSTATEMENT NUMBERS AND CORRESPONDING FRACTIONS OF
     1RESPONSE CORRECT  //)
   30 FORMAT((1H ,7X,5(I6,F6.2)))
   31 FORMAT (1H ,35X,8HCARD NO.,I3  )
   32 FORMAT(1H1,9X,33HPUNCHING ERROR IN CONTROL MS DATA )
   33 FORMAT(1H1,9X,44HNUMBERS ARE TOO BIG--CHECK SECOND DATA CARD )
   34 FORMAT(1H1,9X,46HWEIGHTING FACTOR ERROR--CHECK SECOND DATA CARD )
      END
$IBFTC DECOM2  DECK
      SUBROUTINE DECODE(9,PUNCH)
      DIMENSION CODE(270),B(810),CHAR(8)
      COMMON NCARDS,CODE
      INTEGER CODE,CODEMS,CHAR
      LOGICAL B,PUNCH
      DATA (CHAR(K),K=1,8)/1H ,1H0,1H4,1H8,1HU,1HY,1H-,1H(/
      DATA NC/27/
      DO 18 J=1,NCARDS
      LC=NC*(J-1)
      LM=3*LC
      DO 17 N=1,27
      KT=N+LM
      KM=KT+NC
      KB=KM+NC
      NCOL=N+LC
      CODEMS=CODE(NCOL)
      IF(CODEMS .NE.CHAR(1)) GO TO 10
      B(KT)=.FALSE.
      B(KM)=.FALSE.
      B(KB)=.FALSE.
      GO TO 17
   10 IF(CODEMS .NE.CHAR(2)) GO TO 11
      B(KT)=.TRUE.
      B(KM)=.FALSE.
      B(KB)=.FALSE.
      GO TO 17
   11 IF(CODEMS .NE.CHAR(3)) GO TO 12
      B(KT)=.FALSE.
      B(KM)=.TRUE.
      B(KB)=.FALSE.
      GO TO 17
   12 IF(CODEMS .NE.CHAR(4)) GO TO 13
      B(KT)=.FALSE.
      B(KM)=.FALSE.
      B(KB)=.TRUE.
      GO TO 17
   13 IF(CODEMS .NE.CHAR(5)) GO TO 14
      B(KT)=.TRUE.
      B(KM)=.TRUE.
      B(KB)=.FALSE.
      GO TO 17
   14 IF(CODEMS .NE.CHAR(6)) GO TO 15
      B(KT)=.TRUE.
      B(KM)=.FALSE.
      B(KB)=.TRUE.
      GO TO 17
   15 IF(CODEMS .NE.CHAR(7)) GO TO 16
      B(KT)=.FALSE.
```

```
      B(KM)=.TRUE.
      B(KB)=.TRUE.
      GO TO 17
   16 IF(CODEMS .NE.CHAR(8)) PUNCH=.FALSE.
      B(KT)=.TRUE.
      B(KM)=.TRUE.
      B(KB)=.TRUE.
   17 CONTINUE
   18 CONTINUE
      RETURN
      END
$DATA
DEVELOPMENT TEST OF PROGRAM MARKTF-M7-F4. MULTIPLE MS DECK.
   324     22   1.0
4U484-(8(-4U 8   0OY-U8Y-YUO
 8Y4- -Y ( 4Y(4Y 48 ((4(0Y-
UU 4 Y-4Y 43Y48U-Y(0U840((Y
 088804Y4(0-80-Y ((YY(0Y UY
-U4848Y-(-4U Y  -U(-U8( YUUBLAKE,E.M.   I  ENG.L.L.  UC          65.4 2.5
 8Y44 8( (( UUY0-8 Y(48 Y-BLAKE,E.M.   I  ENG.L.L.  UC
U4 4 Y-4Y(48(48((8(YU840((8BLAKE,E.M.   I  ENG.L.L.  UC
 088Y04Y4(088U4( (U8Y(0Y U08LAKE,E.M.   I  ENG.L.L.  UC
Y4-8U8(4Y(-U 848UY(-U8U80(UDOBLE,RICHARD  I  SOC+PHIL  VIC     75.3 2.5
 8YUY -( (0-Y(4Y U88((4- Y(DOBLE,RICHARD  I  SOC+PHIL  VIC
4(  Y8 UY 8(U44-8( 8 U0YY8DOBLE,RICHARD  I  SOC+PHIL  VIC
  Y8U04Y4Y08 U(488U8Y( 8 UYDOBLE,RICHARD  I  SOC+PHIL  VIC
=UU488YY(-40-04 UY(U 8U (84DUNCAN,B.W.   II  GEN.ARTS  UC       65.4 2.5
 8Y4( 4( U YY-UY 484((4-00(DUNCAN,B.W.   II  GEN.ARTS  UC
0( -U((48Y  --8((8(0U-4YYUYDUNCAN,B.W.   II  GEN.ARTS  UC
 80-UU-Y (08 (U0-YY88(4( (0DUNCAN,B.W.   II  GEN.ARTS  UC
-U48UYU8Y-4U  - (YU-0Y0 UYUDUNLEVIE, LINDA  I  SOC+PHIL  UC     55.6 2.5
 88Y4U 004(04Y(UY -0-((48YY8DUNLEVIE, LINDA  I  SOC+PHIL  UC
U(  -8Y-4CY4YY- (48Y0(  0((8DUNLEVIE, LINDA  I  SOC+PHIL  UC
 YY4Y -Y4(Y8-U40 848Y(U8 U8DUNLEVIE, LINDA  I  SOC+PHIL  UC
-U48-Y8-Y-4U 8(-YU(4UY(0Y- ELLIS,MISS P.J.  I  SOC+PHIL  VIC    43.2 2.5
 88( Y -0Y4 (((4Y -0-((4-0Y0ELLIS,MISS P.J.  I  SOC+PHIL  VIC
 (( 4YY44(YUY8-(U(8(0(800(4(ELLIS,MISS P.J.  I  SOC+PHIL  VIC
  888(U4Y4(0Y8 4(8-08((UY4(0ELLIS,MISS P.J.  I  SOC+PHIL  VIC
4048---4Y-4(0 4 UY44080- (UFAYE,GORDON DAVID  I  SOC+PHIL  SMC 65.4 2.5
 8YYU( (Y 0 4Y(4Y04  ((--0YYFAYE,GORDON DAVID  I  SOC+PHIL  SMC
4U 40Y84YY4888 U(Y(448Y0((YFAYE,GORDON DAVID  I  SOC+PHIL  SMC
 088-0U-Y4-U88U ( -4 88Y( U8FAYE,GORDON DAVID  I  SOC+PHIL  SMC
-U4886Y Y-80  8-0--00U400UGARGER,STEPHANIE ANNE I SOC+PHIL VIC38.3 2.5
  Y Y 8 808-.--Y 40 U(4-Y(0GARGER,STEPHANIE ANNE I SOC+PHIL VIC
48 488Y4U0 8Y4-U4Y(0  U0UY8GARGER,STEPHANIE ANNE I SOC+PHIL VIC
 408(04Y4-UY U-Y8-U8Y(8Y UYGARGER,STEPHANIE ANNE I SOC+PHIL VIC
4U(8U8- Y--(004  Y(-U8U-0U8GRAHAM,DAVID  I  SOC+PHIL  VIC      55.6 2.5
Y8YU( (( (Y4Y(4Y0(  ((-8U(YGRAHAM,DAVID  I  SOC+PHIL  VIC
UU 4 Y- 0(  -(48U-YU 0-(UYU8GRAHAM,DAVID  I  SOC+PHIL  VIC
 8Y8Y -YU-4-8 4Y YU4U(0( UYGRAHAM,DAVID  I  SOC+PHIL  VIC
4Y484(88Y-UU07 40YU4UYU80 UHALLAM,C.B.  I  SOC+PHIL  NC        45.7 2.5
 08YU8 (  -0- 40Y44Y Y-4800SHALLAM,C.B.  I  SOC+PHIL  NC
UU (8Y-4UY48-48(48(00Y40((  HALLAM,C.B.  I  SOC+PHIL  NC
 YY8(04Y4(Y- 0(Y -08((4Y8UYHALLAM,C.B.  I  SOC+PHIL  NC
UU-84Y-4(-4(  4 Y(Y- YU 04UHIBBINS,SUSAN  I  ML+L  UC          67.9 2.5
 8Y - (( U04(-40 48 8(4- Y HIBBINS,SUSAN  I  ML+L  UC
40 -Y8- (Y48848(-8(UU840Y(8HIBBINS,SUSAN  I  ML+L  UC
 Y88( 4Y4U08-U400808Y(0Y 0(HIBBINS,SUSAN  I  ML+L  UC
004848(0Y--U0Y44(0((UYU Y44IRVINE,E.P.  I SOC+PHIL  VIC         53.1 2.5
 8YUY -Y040UYY4Y -Y8(( 480YIRVINE,E.P.  I SOC+PHIL  VIC
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4(48Y-4YY 8((- -Y(8-U0(UYIRVINE,E.P.	I	SOC+PHIL	VIC			
Y-U0UY4(0Y-UYY (U-YY Y U8IRVINE,E.P.	I	SOC+PHIL	VIC			
-UU84(8(-4(0 -0(--00U(804JONES,K.G.	I	SOC+PHIL	VIC		75.3	2.5
8Y4((((4Y(4Y -Y4((4-0(8JONES,K.G.	I	SOC+PHIL	VIC			
U(408-40Y48Y4 U-Y- 0-40Y0(JONES,K.G.	I	SOC+PHIL	VIC			
8YYY 4Y4UY--0Y00((8-(08 UYJONES,K.G.	I	SOC+PHIL	VIC			
UU-8U8Y-Y-4(0 4 Y0U(08(4Y-0KEE,S.E.	I	SOC+PHIL	VIC.		70.4	2.5
8YUY -Y0(0UYU4Y -8 ((4-YU8KEE,S.E.	I	SOC+PHIL	VIC.			
U8 48Y- YY48Y4-((Y(U8 0Y(0KEE,S.E.	I	SOC+PHIL	VIC.			
Y08U04Y4(Y-8U-04(UYYYU(8U8KEE,S.E.	I	SOC+PHIL	VIC.			
(U4Y4Y4 Y(-00 -(0(408U 8(LOKESANSZKY,LORAND	I	SOC+PHIL	SMC	55.6	2.5	
88(48 Y4 4048(8 U88(Y4-0Y8LOKESANSZKY,LORAND	I	SOC+PHIL	SMC			
40 -Y- U8 8(-U(-0(UU-U0Y0-LOKESANSZKY,LORAND	I	SOC+PHIL	NC			
0 Y-0--Y4(0(-8-Y (88 YU- U LOKESANSZKY,LORAND	I	SOC+PHIL	NC			
-U-84(88Y(UU0Y4 UY((0 MATHER,V.R.	I	SOC+PHIL	VIC		53.1	2.5
-YU(((0 4Y(0 YY8((U(0YMATHER,V.R.	I	SOC+PHIL	VIC			
4U 80Y84 048(Y8((8(U840YU-MATHER,V.R.	I	SOC+PHIL	VIC			
0Y80(4Y4(-8U804(YYY(UYUUYMATHER,V.R.	I	SOC+PHIL	VIC			
8UU888(Y(-U00 (0(4U 060(UMATTLESS,D.R.	I	SOC+PHIL	NC		67.9	2.5
8(0Y -0 U048(4Y -88((4-0YYMATTLESS,D.R.	I	SOC+PHIL	NC			
0U 4 Y-4YY 8Y48(-Y(0U8-U(Y(MATTLESS,D.R.	I	SOC+PHIL	NC			
Y8004YU(8 U--0YU8Y(8 UYMATTLESS,D.R.	I	SOC+PHIL	NC			
Y048UY8UY(4U0Y4 80(((8U -00PIPHER, J. P.	I	SOC+PHIL	UC		67.9	2.5
8Y4Y -- ((0-4Y0-8 Y(4-0Y-PIPHER, J. P.	I	SOC+PHIL	UC			
UU -0848Y 8Y484-8(U840((8PIPHER, J. P.	I	SOC+PHIL	NC			
Y8YY0(Y4-48-U-Y -08YY0Y8U0PIPHER, J. P.	I	SOC+PHIL	NC			
(0-8UY-8Y84U (UY0(8U8 4USTONE,DAVID B.	I	SOC+PHIL	VIC		60.5	2.5
Y4Y 4((048U4 -Y (Y4-Y8(STONE,DAVID B.	I	SOC+PHIL	VIC			
4U 48Y-4Y84Y888U(((0U84YYYYSTONE,DAVID B.	I	SOC+PHIL	VIC			
48Y8Y -YU-8(80-Y 8(UYYU8 UYSTONE,DAVID B.	I	SOC+PHIL	VIC			
8U-84Y-4Y-4U084 Y0(-U 080UUVANDENBERK,DIDI	I	SOC+PHIL	VIC		63.0	2.5
8Y4(YU8804Y-4Y UY (U4-0YYVANDENBERK,DIDI	I	SOC+PHIL	VIC			
4U -0Y8-8(4 (- U-8(U0840(0YVANDENBERK,DIDI	I	SOC+PHIL	VIC			
Y8YU-Y440-8 Y -UY((UY 0YVANDENBERK,DIDI	I	SOC+PHIL	VIC			
8U4Y -Y8Y(U0 - 40((4U YU(WESTLAKE,SHARON LYNNE	I	SOC+PHIL	NC	48.1	2.5	
8 (0 --8U 4Y84Y 484((48Y0 WESTLAKE,SHARON LYNNE	I	SOC+PHIL	NC			
-0 8(Y((0 Y--4U8(YU-4Y(-8WESTLAKE,SHARON LYNNE	I	SOC+PHIL	NC			
YY8 4-Y4(Y- UUY8(08Y(0Y4UYWESTLAKE,SHARON LYNNE	I	SOC+PHIL	NC			
4U484Y84Y--U0 80(--UY080UUWYLIE,LYNDA MARION	I	SOC+PHIL	NC	72.8	2.5	
8YU- -U - 4Y(Y -Y ((4-0YYWYLIE,LYNDA MARION	I	SOC+PHIL	NC			
UU 44Y-4Y048(4-(U8(U800(Y WYLIE,LYNDA MARION	I	SOC+PHIL	NC			
4U88Y0-Y4(Y88U(Y (U8Y(UY8U8WYLIE,LYNDA MARION	I	SOC+PHIL	NC			
Y(4Y 8- Y-8U0 4(0(-0Y08Y0UYOUNG, ELIZABETH K.	I	SOC+PHIL	VIC	67.9	2.5	
88(4 -(4U0-Y-4Y -84((4(088YOUNG, ELIZABETH K.	I	SOC+PHIL	VIC			
(U 4 Y-4084Y-4-4-8(0U8 0YY8YOUNG, ELIZABETH K.	I	SOC+PHIL	VIC			
Y-004Y4-088 4Y (U Y(UY UYYOUNG, ELIZABETH K.	I	SOC+PHIL	VIC			

DEVELOPMENT TEST OF PROGRAM MARKTF-M7-F4. MULTIPLE MS DECK.

NAME	PRIOR	BONUS	TEST	FINAL
BLAKE,P.M. I ENG.L.L. UC	65.4	2.5	72.2	70.1
DOBLE,RICHARD I SOC+PHIL VIC	75.3	2.5	51.9	64.8
DUNCAN,J.W. II GEN.ARTS UC	65.4	2.5	39.5	53.7
DUNLEVIE, LINDA I SOC+PHIL UC	55.6	2.5	51.2	54.7
ELLIS,MISS P.J. I SOC+PHIL VIC	43.2	2.5	45.1	45.4
FAYE,GORDON DAVID I SOC+PHIL SMC	65.4	2.5	53.1	60.5
GARGER,STEPHANIE ANNE I SOC+PHIL VIC	38.3	2.5	44.4	42.6
GRAHAM,DAVID I SOC+PHIL VIC	55.6	2.5	54.3	56.2
HALLAM,C.B. I SOC+PHIL NC	45.7	2.5	54.3	51.3
HIBBINS,SUSAN I ML+L UC	67.9	2.5	55.8	63.6
IRVINE,E.P. I SOC+PHIL VIC	53.1	2.5	51.9	53.7
JONES,K.G. I SOC+PHIL VIC	75.3	2.5	59.9	68.8
KEC,S.E. I SOC+PHIL VIC.	70.4	2.5	64.2	68.5
LOKESANSZKY,LORAND I SOC+PHIL SMC	55.6	2.5	40.1	49.1
MATHER,V.R. I SOC+PHIL VIC	53.1	2.5	53.7	54.7
MATTLESS,D.R. I SOC+PHIL NC	67.9	2.5	63.0	66.7
PIPHER, J. P. I SOC+PHIL UC	67.9	2.5	56.2	63.3
STONE,DAVID B. I SOC+PHIL VIC	60.5	2.5	53.1	58.0
VANDENBERK,DIDI I SOC+PHIL VIC	63.0	2.5	61.1	63.3
WESTLAKE,SHARON LYNNE I SOC+PHIL NC	48.1	2.5	46.9	48.8
WYLIE,LYNDA MARION I SOC+PHIL NC	72.8	2.5	65.4	70.4
YOUNG, ELIZABETH K. I SOC+PHIL VIC	67.9	2.5	61.1	65.8

CLASS	FREQ(TEST)	CLASS	FREQ(FINAL)
0.0	0.0000	0.0	0.0000
5.0	0.0000	5.0	0.0000
10.0	0.0000	10.0	0.0000
15.0	0.0000	15.0	0.0000
20.0	0.0000	20.0	0.0000
25.0	0.0000	25.0	0.0000
30.0	0.0000	30.0	0.0000
35.0	0.0455	35.0	0.0000
40.0	0.1364	40.0	0.0455
45.0	0.1818	45.0	0.1818
50.0	0.4545	50.0	0.3636
55.0	0.5000	55.0	0.3182
60.0	0.3182	60.0	0.3182
65.0	0.2273	65.0	0.4091
70.0	0.0909	70.0	0.2727
75.0	0.0455	75.0	0.0909
80.0	0.0000	80.0	0.0000
85.0	0.0000	85.0	0.0000
90.0	0.0000	90.0	0.0000
95.0	0.0000	95.0	0.0000
100.0	0.0000	100.0	0.0000
AVERAGE =	54.52	AVERAGE =	58.81

STATEMENT NUMBERS AND CORRESPONDING FRACTIONS OF RESPONSE CORRECT

CARD NO. 1

1	0.64	2	0.95	3	0.82	4	0.86	5	0.73
6	0.50	7	0.41	8	0.86	9	1.00	10	0.73
11	0.91	12	1.00	13	0.77	14	0.55	15	0.91
16	1.00	17	0.73	18	1.00	19	0.82	20	0.68
21	0.82	22	0.59	23	1.00	24	0.91	25	0.73
26	0.64	27	0.68	28	0.68	29	0.77	30	1.00
31	0.95	32	0.77	33	0.23	34	0.50	35	0.59
36	0.18	37	0.95	38	0.86	39	0.86	40	0.95
41	1.00	42	0.36	43	0.73	44	0.45	45	0.73
46	0.14	47	1.00	48	0.50	49	0.95	50	0.36
51	0.23	52	0.86	53	0.64	54	0.27	55	0.32
56	0.91	57	0.68	58	0.95	59	0.77	60	1.00
61	0.86	62	0.45	63	1.00	64	1.00	65	0.64
66	0.77	67	0.95	68	0.32	69	0.82	70	0.73
71	0.45	72	0.55	73	0.77	74	0.73	75	0.91
76	0.73	77	0.09	78	0.45	79	0.45	80	0.64
81	0.91								

CARD NO. 2

1	0.91	2	0.95	3	1.00	4	0.55	5	0.32
6	1.00	7	0.59	8	0.77	9	0.86	10	0.73
11	0.64	12	0.73	13	0.82	14	0.64	15	0.82
16	0.91	17	0.82	18	0.77	19	0.55	20	1.00
21	0.95	22	0.95	23	0.95	24	0.09	25	0.77
26	0.91	27	0.45	28	1.00	29	0.95	30	0.77
31	0.73	32	0.50	33	1.00	34	0.77	35	0.36
36	0.91	37	0.82	38	1.00	39	0.95	40	0.95
41	0.91	42	0.82	43	1.00	44	0.95	45	0.95
46	1.00	47	0.73	48	0.82	49	0.91	50	0.95
51	0.77	52	0.95	53	0.82	54	0.23	55	0.68
56	0.86	57	1.00	58	1.00	59	0.82	60	1.00
61	0.86	62	0.64	63	0.82	64	0.50	65	0.91
66	0.64	67	0.77	68	0.82	69	0.95	70	0.86
71	1.00	72	0.41	73	0.77	74	0.68	75	0.95
76	0.95	77	0.91	78	0.95	79	0.73	80	0.73
81	0.82								

CARD NO. 3

1	0.55	2	0.91	3	1.00	4	0.95	5	0.64
6	0.86	7	0.86	8	1.00	9	0.82	10	0.86
11	0.95	12	0.82	13	0.68	14	0.86	15	0.91
16	0.77	17	0.59	18	0.41	19	0.95	20	0.59
21	0.82	22	0.95	23	0.64	24	1.00	25	1.00
26	0.91	27	0.41	28	0.91	29	0.77	30	1.00
31	0.77	32	0.77	33	0.95	34	0.73	35	0.73
36	0.68	37	0.86	38	0.59	39	0.95	40	0.50
41	0.86	42	0.59	43	0.95	44	1.00	45	0.95
46	0.95	47	0.82	48	0.68	49	0.73	50	0.73
51	0.91	52	0.55	53	0.59	54	0.77	55	0.86
56	0.68	57	1.00	58	0.68	59	0.50	60	0.95
61	0.95	62	0.95	63	0.59	64	0.18	65	1.00
66	0.86	67	1.00	68	0.55	69	0.73	70	0.55
71	0.77	72	0.95	73	0.95	74	0.91	75	0.82
76	0.86	77	0.86	78	0.86	79	0.95	80	0.64
81	0.86								

STATEMENT NUMBERS AND CORRESPONDING FRACTIONS OF RESPONSE CORRECT

CARD NO. 4

1	0.91	2	0.45	3	0.27	4	0.91	5	0.05
6	0.65	7	0.91	8	1.00	9	0.86	10	0.68
11	0.77	12	0.77	13	0.95	14	0.91	15	0.68
16	0.91	17	0.91	18	0.55	19	0.86	20	0.18
21	0.82	22	0.95	23	0.73	24	0.73	25	0.95
26	1.00	27	0.73	28	0.91	29	0.91	30	1.00
31	0.73	32	0.64	33	0.66	34	1.00	35	1.00
36	0.95	37	0.95	38	0.82	39	0.41	40	0.73
41	0.36	42	0.77	43	0.77	44	0.86	45	0.68
46	0.64	47	0.86	48	0.77	49	0.73	50	0.50
51	0.77	52	0.86	53	0.91	54	0.95	55	1.00
56	0.45	57	0.86	58	0.95	59	0.55	60	0.91
61	0.55	62	1.00	63	1.00	64	0.86	65	0.68
66	1.00	67	0.73	68	0.91	69	0.55	70	0.68
71	0.73	72	1.00	73	0.23	74	0.82	75	0.91
76	1.00	77	0.91	78	1.00	79	0.82	80	0.91
81	0.77								